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PATENT APPLICATION

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ABSTRACT

A dispersing Fourier Transform interferometer (DFTS) includes a Fourier

Transform Spectrometer having an input for receiving a source light and an output, and a

10 dispersive element having an input coupled to the Fourier Transform Spectrometer output

and an output for providing the resulting multiple narrowband interferogram outputs of

different wavelengths representative of the source light input. A processor applies a sparse

sampling algorithm for determining the best fit between a set of model interferograms and

the set of data interferograms. The model interferogram is inferred as specified at a

15 discrete set of lags, a difference is determined between the model interferogram and the

data interferogram, and an optimization method determines the model interferogram best

matched to the data interferogram. The DFTS interferometer improves the sensitivity of a

standard FTS by including a dispersive element, increasing the SNR by a factor of $(R_g)^{1/2}$

as compared to the FTS, where R_g is the resolving power of the conventional dispersing

20 spectrometer (i.e. $R_g = \lambda/\Delta\lambda$).